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Tamara Alcaraz

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Reissue application of:

James D. RALPH and Stephen TATAR

Patent No.: 5,882,350

Issue Date: March 16, 1999

Serial No.: To Be Assigned

Filing Date: Herewith

For: POLYAXIAL PEDICLE SCREW  
HAVING A THREADED AND TAPERED  
COMPRESSION LOCKING  
MECHANISM

Examiner: D. Reip

Group Art Unit: 3731

PRELIMINARY AMENDMENT

Box PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Prior to examination on the merits, Patentees respectfully requests entry of this Preliminary Amendment for the above-captioned reissue patent application. This is a continuation application of currently pending reissue application 09/774,915.

## AMENDMENTS

### In the Claims

Please cancel claims 1-11.

Please add the following new claims 12-23:

--12. An orthopedic device for securing immobilizing structures to sequences of bones, comprising:

a screw having a semi-spherical head and a threaded shaft;

a coupling element having an axial hole extending therethrough, a portion of the axial hole defining an interior volume for receiving therein the semi-spherical head of the screw such that the threaded shaft may be moved through a variety of angles relative to the axial hole, the coupling element further including at least one slot rendering at least the interior volume deformable, the coupling element further including a tapered exterior surface;

a receiving member including a through hole having an interior wall surface, a portion of the interior wall surface of the through hole being shaped to receive the coupling element and the screw when the semi-spherical head of the screw is mounted within the coupling element; and

wherein advancement of the screw through the through hole relative to the receiving member when the exterior surface of the coupling element engages the interior wall surface of the through hole prevents the coupling element from further advancement through the hole, preventing the semi-spherical head of the screw from advancing further through the through hole, and causing locking of the screw relative to both the coupling element and to the receiving member thereby locking the angle of the screw relative to the axial hole.

13. The assembly as set forth in claim 12, wherein the semi-spherical head of the screw further includes a recess formed therein for receiving therein a screwdriving tool such that the screw may be advanced into a vertebral bone.

14. The assembly as set forth in claim 12, wherein the coupling element comprises a two-piece interlocking coupling element including:

a socket portion containing the interior volume, the interior volume being semi-spherical shaped, the socket portion further including upper and lower sections, and at least one vertical slot formed in each of the upper and lower sections, at least one of the slots rendering the interior volume deformable, the lower section having the tapered exterior surface; and

a cap portion having an opening in a bottom thereof and an interior chamber extending upwardly therefrom for joining with, and slideably retaining therein, the upper section of the socket portion.

15. The polyaxial screw as set forth in claim 14, wherein the cap portion further includes a threading.

16. An orthopedic implant apparatus comprising:

a fixation element having a semi-spherical head and a shaft extending therefrom;

a receiving member including an axial bore defined by an interior surface wall, a portion of the axial bore having a tapered portion;

a socket portion having a semi-spherical interior volume for receiving therein the semi-spherical head, and an exterior surface capable of nesting against the interior surface wall of the tapered portion, the socket portion being located in the axial bore of the receiving member;

wherein the semi-spherical head is rotationally freely mounted within the semi-spherical interior volume of the socket portion prior to the socket portion being forcibly advanced against the interior surface wall of the tapered portion, and whereby after forcible advancement of the socket portion causes the fixation element, the socket portion and receiving member to be locked relative to one another.

17. The assembly as set forth in claim 16, wherein the semi-spherical head of the fixation element further includes a recess formed therein for receiving therein a screwdriving tool such that the fixation element may be advanced into a vertebral bone.

18. The assembly as set forth in claim 16, wherein the socket portion comprises an interlocking subassembly including:

an upper and lower socket sections, and at least one vertical slot formed at least one of the upper or lower sections, the at least one slot rendering the spherical interior volume deformable, where the exterior surface of the socket portion is tapered and located on the lower section; and

a cap portion having an opening in a bottom thereof and an interior chamber extending upwardly therefrom for joining with, and slidably retaining therein, the upper socket section.

19. The polyaxial screw as set forth in claim 18, wherein the cap portion further includes a threading.

20. An orthopedic implant apparatus comprising:

a fixation element having a semi-spherical head, having a lower and upper curvate surface, and a threaded shaft extending from the semi-spherical head;

a receiving member including an axial bore defined by an interior surface wall, the axial bore having a lower portion and an upper threaded portion;

a socket portion containing the semi-spherical head of the fixation element therein and having a lower socket portion and a threaded upper socket portion, the socket portion being moveably located in the axial bore;

wherein the lower socket portion has an interior volume defined by an interior surface which receives the lower curvate surface of the semi-spherical head, such that the threaded shaft is inserted through a hole in the interior surface and is capable of being moved through a variety of angles relative to the socket portion, the lower socket portion further including an exterior surface which seats against the interior surface wall of the lower portion; and

the threaded upper socket portion, disposed above the upper curvate surface of the semi-spherical head of the fixation element, and which engages the upper threaded portion of the receiving member, wherein the threaded upper socket portion is capable of being threadably advanced in the upper threaded portion of the receiving member advancing the fixation element relative to the lower socket portion causing compression of the lower curvate surface against the interior surface of the lower socket portion, whereby compression of the lower curvate surface against the interior surface of the lower socket portion locks the fixation element relative to the

socket portion, causing the upper and lower socket portions, the semi-spherical head of the fixation element, and the receiving member to be locked relative to one another.

21. The assembly as set forth in claim 20, wherein the semi-spherical head of the fixation element further includes a recess formed therein for receiving therein a screwdriving tool such that the fixation element may be threadably advanced into a vertebral bone.

22. The assembly as set forth in claim 20, wherein the interior volume of the lower socket portion is semi-spherical and the lower socket portion further includes at least one vertical slot rendering the interior volume deformable.

23. The assembly as set forth in claim 22, wherein the threaded upper socket portion comprises a cap portion having an opening in a bottom thereof and an interior chamber extending upwardly therefrom for joining with, and slidably retaining therein, the lower socket portion.--

#### REMARKS

Entry of the foregoing amendment is respectfully requested. Basis for the amendment can be found throughout the Specification. No new matter is believed to be added by way of this amendment.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 337562000901. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

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By: Johnny W. Han (45,565) for  
Sanjay S. Bagade  
Registration No. 42,280

Morrison & Foerster LLP  
755 Page Mill Road  
Palo Alto, California 94304-1018  
Telephone: (650) 813-5720  
Facsimile: (650) 494-0792